

Evolution of Globular Cluster Sizes in Early-Type Galaxies

Carl J. Grillmair
&
Jon Holtzman

We measure structural parameters (core radii and concentrations) of globular clusters in three early-type galaxies using deep, four-point dithered, WFPC2 Hubble Space Telescope observations. We have chosen globular cluster systems which have young, intermediate age, and old cluster populations, as indicated by cluster colors and luminosities.

Our primary goal is to test the hypothesis that globular cluster luminosity functions evolve towards a ``universal'' form. Previous observations have shown that young cluster systems have exponential luminosity functions rather than the characteristic log-normal luminosity function of old cluster systems. We test to see whether these young systems exhibit a wider range of structural parameters than old systems, and discuss whether and at what rate plausible disruption mechanisms will cause the luminosity functions to evolve towards a log-normal form.

A simple observational comparison of structural parameters between different age cluster populations and between different sub-populations within the same galaxy has strong implications concerning both the formation and destruction mechanisms of star clusters, the distinction between open and globular clusters, and the advisability of using globular cluster luminosity functions as distance indicators.